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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,128	09/20/2001	Andrew D. Murdin	032931-0252	9510

7590 11/06/2003

Bernhard D Saxe
Foley & Lardner
Suite 500
3000 K Street NW
Washington, DC 20007-5109

EXAMINER	
MINNIFIELD, NITA M	

ART UNIT	PAPER NUMBER
1645	

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/857,128	MURDIN ET AL.	
	Examiner	Art Unit	
	N. M. Minnifield	1645	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892) Esheets
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4, 11* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Applicant's election with traverse of Group 11, claims 1-19, 25 and 38(a) drawn to nucleic acids, vectors, host cells, and a method of producing the polypeptide CPN100638 (SEQ ID Nos: 5, 6 and 14), fragments and compositions thereof, in Paper No. 10 is acknowledged. The traversal is on the ground(s) that

(a) The DNA and the polypeptide have the same essential structural element,

(b) Example 17 of annex B states that there is unity between protein and DNA,

(c) The polypeptide and its corresponding antibody share a special technical feature,

(d) The protein/DNA and methods of using them share a special technical feature,

(e) The antibody and methods of using them share a special technical feature and

(f) Burden of search.

This is found persuasive. All inventions will be rejoined and examined only with respect to SEQ ID NOs: 5, 6 and 14.

The requirement is still deemed proper and is therefore made FINAL.

2. Applicants' amendment filed June 27, 2003 is acknowledged and has been entered. Claims 1, 2, 7-9, 13, 15, 16, 18-22, 25, 27, 28 and 33-39 have been amended. Claims 1-39 are now pending in the present application. All claims, 1-39, will be examined as they relate to SEQ ID NOs: 5, 6 and 14.

3. The disclosure is objected to because of the following informalities: p. 2, l. 14, period missing and no spacing; p. 4, l. 33, "has" should be –have--; p. 6, l. 25, "INFg" should be –INF gamma--; p. 15, l. 10, no spacing; p. 15, l. 13, "2.5 MM"

should be –2.5 mM--; p. 17, l. 16, "reduction is severity" should be –reduction in severity--; p. 17, l. 19-21, the reference citation is incomplete, what is the title of the journal; p. 24, the ATCC address is incorrect (see correct address below) and there bay be other informalities. Appropriate correction is required.

Applicant is reminded that the following and should amend the specification accordingly. The current address of the ATCC is as follows:

American Type Culture Collection
10801 University Boulevard
Manassas, VA 20110-2209

4. The use of trademarks has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner, which might adversely affect their validity as trademarks.

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1-7, 17, 20-24, 26 and 35-39 are rejected under 35 USC 101 because the claimed invention is directed to non-statutory subject matter.

The claims, as written, do not sufficiently distinguish over nucleic acids, proteins, cells and antibodies as they exist naturally because the claims do not particularly point out any non-naturally occurring differences between the claimed products and the naturally occurring products. In the absence of the hand of man, the naturally occurring products are considered non-statutory subject matter. *See Diamond v. Chakrabarty*, 447 U.S. 303, 206 USPQ 193 (1980). The claims should be amended to indicate the hand of the inventor, e.g., by insertion of "Isolated" or "Purified" assuming the specification finds support for such a recitation. See MPEP 2105.

7. Claims 8-14, 16, 18, 19 and 37-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 8-14 and 16 are vague and indefinite in the recitation of "capable of being expressed". It has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138. Claims 18 and 19 are vague and indefinite in the recitation of "hybridizes under stringent conditions"; what are these conditions. It is noted that the specification only mentions that hybridization procedures are well-known in the art and are described in Ausubel et al, Silhavy et al and Davis et al. However, specific stringent hybridization conditions have not been set forth. Claim 37 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: what are the other steps in the method of detecting

Chlamydia infection? Claim 38 is vague and indefinite in the recitation of "diagnostic kit", what are the other components of this diagnostic kit? Claim 39 is vague and indefinite in the recitation of "lessen the severity", what does Applicant intend? Claim 39 is vague and indefinite in the recitation of "immunized with polypeptide", see line 3 of the claim. Does Applicant intend this polypeptide to be the polypeptide of claim 20? Claim 8 is vague and indefinite in the recitation of item (ii) and item (v), they appear to be the same. Clarification is requested.

8. Claims 1-39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification appears to be enabled for a DNA vaccine for protecting against respiratory tract infection caused by *C. pneumoniae*. However, it is not clear which DNA encoding polypeptide was used. The specification states mice were immunized intramuscularly (i.m.) plus intranasally (i.n.) with plasmid DNA containing the coding sequence of a *C. pneumoniae* polypeptide. Was this SEQ ID NO: 5 or 6? Was the nucleic acid sequence that encodes the polypeptide of SEQ ID NO: 14 used? Further, the specification does not enable a DNA vaccine to protect against all Chlamydia infection (i.e. infection caused by *C. trachomatis*, *C. psittaci*, or *C. pecorum*). Will the *C. pnuemoniae*, assuming it is claimed SEQ ID NO: 14, protect against or treat infection caused by each one of these Chlamydia— *C. pneumoniae, C. trachomatis, C psittaci, C. pecorum*? What is the function of the polypeptide set forth in SEQ ID NO: 14? It

is noted that there are differences in these chlamydial species. *C. trachomatis* and *C. pneumoniae* are both pathogens of humans but differ in their tissue tropism and spectrum of diseases. *C. pneumoniae* is a newly recognized species of Chlamydia that is a natural pathogen of humans and causes pneumonia and bronchitis, while *C. trachomatis* infection causes trachoma, an ocular infection that leads to blindness, and sexually transmitted diseases such as PID, chronic pelvic pain, ectopic pregnancy and epididymitis (Kalman et al Nature Genetics, 1999, 21:385-389). Kalman et al teaches that analysis of the *C. pneumoniae* genome revealed 214 protein-coding sequences not found in *C. trachomatis*, most without homologous to other known sequences (Kalman et al p. 385). Although no function has been assigned to most of the unique *C. pneumoniae* genes, several have significant similarity to genes from other organisms (Kalman et al p. 388). Do any of the claimed sequences show similarity to genes known from other organisms? What is the function of the claimed protein? Further, the state of the art is unclear as to whether DNA vaccines are protective against Chlamydia infection. Svanholm et al (Scand. J. Immunol., 2000, 51:345-353) teaches that DNA vaccination using heat shock protein 60 gene of *C. pneumoniae* did not provide protection against challenge with *C. pneumoniae* in mice. However, if pIL-12 were administered there was increased protection of mice against infection with *C. pneumoniae* (abstract). Svanholm et al indicates that "[v]accines against *C. pneumoniae* have not been tested. Moreover, given the low DNA homology and different pathobiology of *C. pneumoniae* and *C. trachomatis*, different mechanisms or antigens may be involved in the protective vaccination." (p. 345, col. 2; see also Brunham et al, J. Infectious Diseases, 2000, 181/Suppl. 3:S538-S543). Penttila et al (Vaccine, 2001, 19:1256-1265) teaches that DNA

immunization with *C. pneumoniae* genes coding for MOMP or phsp60 provided protection against *C. pneumoniae* challenge but pomp2 failed to protect against *C. pneumoniae* challenge (abstract). Penttila et al indicates that the immunology of protection in *C. pneumoniae* infection is poorly understood, antibodies do not protect against *C. pneumoniae* challenge and that DNA vaccination offered no protection from pneumoniae (p. 1261, col. 1). Penttila et al also teaches an interesting difference between chlamydial species is related to the immunological role of MOMP. In *C. trachomatis*, MOMP is the immnodominant antigen, whereas in *C. pneumoniae* antibody responses only weakly target MOMP (p. 1262). Igietseme et al discusses the problems of chlamydia vaccines. "Despite considerable efforts and clinical and experimental evidence suggesting that at least partial protective immunity is feasible in humans, the development of reliable chlamydia vaccines using conventional immunization strategies have proven to be elusive. Among other setbacks, vaccine effectiveness was relatively limited because of poor immunogenicity; more importantly, the use of inactivated whole-chlamydia agents appears to be unattractive due to likely immunopathogenic components." (p. 6803). Saren et al (Infection and Immunity, 2002, 70/7:3336-3343) teaches that there is no vaccine against *C. pneumoniae* infection (abstract). Murdin et al (J. Infectious Diseases, 2000, 181/Suppl. 3:S552-S557) teaches that although considerable progress toward developing a *C. pneumoniae* vaccine has been made in the last 1-2 years, a true candidate vaccine does not yet exist (p. S554). "The development of a candidate vaccine requires the determination of both protective antigens and a safe, effective, formulation of those antigens." (p. S554). Murdin et al teaches that antigen formulation remains an area in which much information is still needed, including what constitutes a protective immune

response to *C. pneumoniae* in humans, how to express recombinant antigens efficiently, and how to formulate them to elicit a protective response in humans (p. S554).

Applicants have indicated in the specification that C. trachomatis infection does not confer cross-immunity to *C. pneumoniae* (p. 3) and that there is no known effective vaccine for any human chlamydial infection (p. 6). The specification also indicates that many antigens recognized by immune sera to *C. pneumoniae* are conserved across all chlamydiae, but a 98, 76 and 54 kDa protein appear to be *C. pneumoniae*-specific (p. 7). The Summary of the Invention asserts that "[t]he present invention provides purified and isolated polynucleotide molecules that encode Chlamydia polypeptides which can be used in methods to prevent, treat, and diagnose Chlamydia infection." (p. 8). However, as set forth above the state of the art is unpredictable in that regard. Applicants have shown only one experiment of protection, using a DNA vaccine, but no other evidence of vaccine compositions comprising the polypeptide or antibody against the polypeptide or fusion proteins providing protection against Chlamydia infection. The specification is not enabled for vaccines that comprise an immunogenic fragment or for methods of detecting a Chlamydial infection. It is not clear from the specification that an immunogenic fragment is enabled, and what is meant by "which has been modified without loss of immunogenicity". In view of the state of the art it is not clear that vaccines as claimed by Applicants are feasible, or enabled.

Further, will the *C. pneumoniae* protein that is claimed detect all types of Chlamydia infections? False positives can be a problem. "The problem of false positive values is thought to arise from widespread infection with a second

chlamydial species, *C. pecorum*, which commonly infects the gut but has also been isolated from cases of polyarthritis and conjunctivitis". Longbottom et al (FEMS Microbiology Letters, 1996, 142:277-281).

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

10. Claims 21 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Accession number P71134, see sequence printout for SEQ ID NO: 14.

The claims are directed to a polypeptide comprising an amino acid sequence of an immunogenic fragment comprising at least 12 consecutive amino acids from SEQ ID NO: 14. The printout discloses 12 consecutive amino acids from SEQ ID

NO: 14. It is noted that products of identical chemical composition can not have mutually exclusive properties. A chemical composition and its properties are inseparable. Therefore, if the prior art discloses the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). See MPEP 2112.01.

The prior art anticipates the claimed invention. Since the Patent Office does not have the facilities for examining and comparing applicants' immunogenic fragment with the immunogenic fragment of the prior art reference, the burden is upon applicants to show a distinction between the material structural and functional characteristics of the claimed immunogenic fragment and the immunogenic fragment of the prior art. See In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and In re Fitzgerald et al., 205 USPQ 594.

11. Claims 1-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Griffais et al (6559294).

Griffais et al discloses the nucleic acid sequences as claimed by Applicants (abstract; col. 12, l. 28-54; see claims). The prior art SEQ ID NO: 1 discloses SEQ ID NO:5 and 6. Griffais et al discloses the amino acid sequence of SEQ ID NO: 14, see SEQ ID NO: 472 of the issued patent (see col. 27 and sequence listing). The prior art discloses the genomic sequence and the nucleotide sequences encoding polypeptides of C. pneumoniae (abstract). Griffais et al discloses vectors including the said sequences and cells or animals transformed with these vectors (cols. 45-48; claims), methods of producing polypeptides (cols. 50-51; claims), fusion proteins (col. 48-49), antisense molecules (col. 49), antibodies (col. 52; col. 54), methods of detection (using nucleic acids, polypeptides or antibodies)

and kits for diagnosing Chlamydia infection (cols. 52-53, 55, 58, 59), primers and probes (cols. 57-58), as well as vaccine and pharmaceutical compositions (col. 61-64) for prevention and/or treatment of Chlamydia infection (abstract). Griffais et al discloses a fragment of at least 5 amino acids of a polypeptide as well as a modified polypeptide (col. 13, l. 43-48; col. 15; col. 27).

It is noted that products of identical chemical composition cannot have mutually exclusive properties. A chemical composition and its properties are inseparable. Therefore, if the prior art discloses the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). See MPEP 2112.01.

The prior art anticipates the claimed invention. Since the Patent Office does not have the facilities for examining and comparing applicants' DNA, proteins, vaccines, compositions, and methods with the DNA, proteins, vaccines, compositions and methods of the prior art reference, the burden is upon applicants to show a distinction between the material structural and functional characteristics of the claimed DNA, proteins, vaccines, compositions, and methods with the DNA, proteins, vaccines, compositions and methods of the prior art. See In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and In re Fitzgerald et al., 205 USPQ 594.

12. No claims are allowed.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. M. Minnifield whose telephone number is 703-305-3394. The examiner can normally be reached on M-F (8:00-5:30) Second Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynette R.F. Smith can be reached on 703-308-3909. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

N.M. Minnifield
Primary Examiner
Art Unit 1645

NMM
October 30, 2003